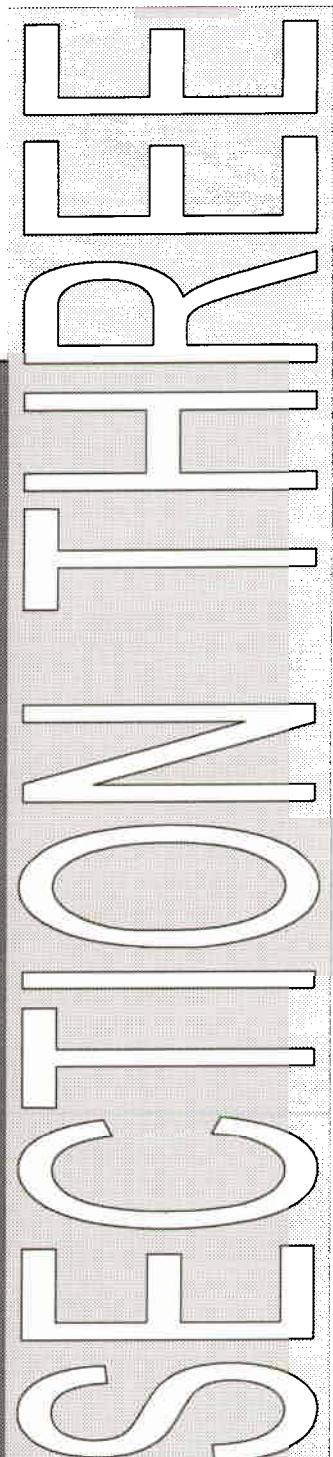


# *Citations and Appendices*

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Appendix A



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## APPENDIX A

Common and scientific names of flora and fauna used in this report, listed in alphabetical order of the common names that appeared in the text.

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### MAMMALS

Arctic ground squirrel, *Spermophilus parryii*  
Arctic fox, *Alopex lagopus*  
bobcat, *Lynx rufus*  
caribou, *Rangifer tarandus*  
cougar, *Puma concolor*  
coyote, *Canis latrans*  
Columbian ground squirrel, *Spermophilus columbianus*  
Dall sheep, *Ovis dalli*  
domestic cow, *Bos taurus*  
domestic sheep, *Ovis aries*  
ermine, *Mustela erminea*  
European hare, *Lepus europaeus*  
European lynx, *Lynx lynx*  
feral cat, *Felis silvestris (=cattus)*  
feral dog, *Canis lupus (=familiaris)*  
fisher, *Martes pennanti*  
hoary marmot, *Marmota caligata*  
human, *Homo sapiens*  
long-tailed weasel, *Mustela frenata*  
lynx, *Lynx canadensis*  
marten, *Martes americana*  
mink, *Mustela vison*  
moose, *Alces alces*  
mountain beaver, *Aplodontia rufa*  
muskrat, *Ondatra zibethicus*  
New England cottontail, *Sylvilagus transitionalis*  
northern red-backed vole, *Clethrionomys rutilus*  
pika, *Ochotona princeps* or *O. collaris*

porcupine, *Erethizon dorsatum*  
red fox, *Vulpes vulpes*  
red squirrel, *Tamiasciurus hudsonicus*  
skunk, *Mephitis mephitis*  
snowshoe hare, *Lepus americanus*  
tundra vole, *Microtus oeconomus*  
white-tailed deer, *Odocoileus virginianus*  
wolf, *Canis lupus*  
wolverine, *Gulo gulo*

### BIRDS

barred owl, *Strix varia*  
golden eagle, *Aquila chrysaetos*  
goshawk, *Accipiter gentilis*  
gray jay, *Perisoreus canadensis*  
great horned owl, *Bubo virginianus*  
great grey owl, *Strix nebulosa*  
ruffed grouse, *Bonasa umbellus*  
northern hawk owl, *Surnia ulula*  
northern spotted owl, *Strix occidentalis*  
ptarmigan, *Lagopus* spp.  
rough-legged hawk, *Buteo lagopus*  
red-tailed hawk, *Buteo jamaicensis*  
snowy owl, *Nyctea scandiaca*

### INSECTS

mountain pine beetle, *Dendroctonus ponderosae*

## APPENDIX A (Cont.)

### TREES

eastern arborvitae cedar, *Thuja occidentalis*  
balsam fir, *Pinus balsamea*  
balsam poplar, *Populus balsamifera*  
birch, *Betula* spp.  
black spruce, *Picea mariana*  
Douglas fir, *Pseudotsuga menziesii*  
Engelmann spruce, *Picea engelmanni*  
jack pine, *Pinus banksiana*  
grand fir, *Abies grandis*  
lodgepole pine, *Pinus contorta*  
ponderosa pine, *Pinus ponderosa*  
quaking aspen, *Populus tremuloides*  
red spruce, *Picea rubra*  
subalpine fir, *Abies lasiocarpa*  
tamarack, *Larix laricina*  
western hemlock, *Tsuga heterophylla*  
western larch, *Larix occidentalis*  
western red cedar, *Thuja plicata*  
white pine, *Pinus monticola*  
white spruce, *Picea glauca*

fescue, *Festuca* spp.  
grouse huckleberry, *Vaccinium scoparium*  
huckleberry, *Vaccinium* spp.  
mountain snowberry, *Symporicarpos oreophilus*  
pachistima, *Pachistima myrsinifolia*  
pinegrass, *Calmagrostis rubescens*  
rabbitbrush, *Chrysothamnus* spp.  
twinflower, *Linnea borealis*  
willow, *Salix* spp.

### OTHER PLANTS

bearberry, *Arctostaphylos uva-ursi*  
beardless bluebunch wheatgrass, *Agropyron spicatum* var. *inerme*  
big sagebrush, *Artemesia tridentata*  
bitterbrush, *Purshia tridentata*  
bog birch, *Betula glandulosa*  
bulrush, *Scirpus* spp.  
Cascade azalea, *Rhododendron albiflorum*  
cattail, *Typha latifolia*  
common snowberry, *Symporicarpos albus*

## APPENDIX B

### Guidelines and Ratios

1. *Ecoprovinces and Ecodivisions.* A system of travel routes will be maintained along major ridges, saddles, and streams to connect DNR-managed lands with neighboring lynx habitat and to provide access to drainages throughout the LMZ. The system was drawn from topographic maps to provide a travel network across each LAU, reflecting lynx habitat use patterns as indicated from the WDFW PHS database. These routes will be field-verified to ensure that the most suitable routes are chosen. A special management zone [travel corridor] will straddle the route so that a  $\geq 330$  feet (100m) corridor (WDFW 1996) is available to lynx at all times. On average, the forested zone along the travel route will likely be much wider.

- a. Actual boundaries of the travel corridor along the travel route will reflect the existing contours of the landscape.
- b. Where the travel route is naturally forested, Forested Habitat conditions will be encouraged within the travel corridor.
- c. If harvest activities must occur within the travel corridor along a ridge or saddle travel route, openings will be minimized (less than 330 feet or 100m wide), techniques to ensure regeneration will be employed, and forested areas will be left on lower slopes and on the other side of the ridge/saddle to provide lynx with alternative travel routes. Also, the context of the zone will be considered, so that an appropriate amount of cover will be left within the corridor.
- d. If roads must be placed on ridges or saddles due to concerns such as slope stability or water quality, road width will be minimized, vegetative cover will be encouraged on both sides of the roads, sight distance will be reduced (330 feet or 100m), and/or the roads will be closed as soon as possible, or at least the frequent use of such roads will be discouraged.

2. *Lynx Management Zones.* Connectivity within LMZ on DNR-managed land will be maintained. Where DNR-managed land is in a critical position (i.e. a narrow constriction within the LMZ, especially along the British Columbia border), forested strips  $\geq 330$  feet (100m) wide will be positioned to facilitate lynx travel through the area, and/or harvest units will be placed to promote connectivity. This may entail keeping harvest units narrow, small, and/or dispersed.

3. *Lynx Analysis Units.* The following ratios of lynx habitat components will be maintained in each LAU on DNR-managed lands where DNR manages 20% or more of the LAU (Loomis State Forest and Little Pend Oreille Block). The percentage ratios are based on the total acres of potential forested lynx habitat per LAU (total LAU acres minus permanent natural openings and sparsely forested areas).

Lynx Habitat:	<b>Forested Habitat</b>	70% minimum
	<b>Temporary Non-lynx Areas</b>	30% maximum
Within Forested Habitat:	<b>Forage Habitat</b>	20% minimum
	<b>Denning Habitat</b>	10% minimum
	Total den sites	min. 2 sites/mi <sup>2</sup>

4. *Lynx Analysis Units.* Timber harvests will incorporate interspersion of habitat components within the lynx habitat matrix where DNR manages 20% or more of the LAU (Loomis State Forest and Little Pend Oreille Block).

- a. Forage Habitat will be connected to travel routes with Forested Habitat within the LAU and located near Denning Habitat (<3 miles or 4.8 km).
- b. To avoid isolation of Denning Habitat, more than 50% of the periphery of Denning Habitat will be bordered by Forested Habitat at all times.

5. *Lynx Analysis Units.* Human-related disturbance will be minimized with road and harvest plans where DNR manages 20% or more of the LAU (Loomis State Forest and Little Pend Oreille Block). Examples include rehabilitation of non-essential roads after harvest, gate placement to limit vehicular access (including snowmobiles), and avoidance of loop roads.

6. *Small Ecosystem/Ecological Communities.* Harvest units (Temporary Non-lynx Areas) will be designed to promote swift vegetative regeneration and snowshoe hare/lynx recolonization.

- a. Unit size will reflect the regeneration capacity of the site and contribute to a diverse mosaic of habitat patches available to snowshoe hare and lynx. Units will be designed so that Temporary Non-lynx Areas never exceed 200 contiguous acres (81 ha). Where DNR manages more than 20% of a LAU, the total Temporary Non-lynx Area per LAU on DNR-managed lands is limited to 30% [4].
- b. Unit shape will enhance the regeneration potential of the unit and provide a diversity of forage and browse opportunities for the lynx and hare.
- c. Unit composition will enhance the regeneration potential of the site and provide opportunities for rapid hare recolonization by containing clumps of remnant vegetation and/or woody debris.
- d. Regeneration techniques will reflect the unit's potential to produce quality hare habitat (unit quality, according to vegetation association) and may involve use of fire or soil scarification techniques.

7. *Small Ecosystem/Ecological Communities.* Quality snowshoe hare browse and cover within Forage Habitat will be maintained by providing horizontal cover densities >40% for 3.3 feet (1m) above average

snow level using a vegetation profile board, viewed from 15m in four directions, according to the procedure outlined by Nudds (1977, distance of 15m to be verified during monitoring).

a. Browse and cover tree species will be provided by species preferred by hares (according to the vegetative association), if preferred species are identified for the area. Otherwise, regeneration efforts will focus on creating the structure (cover density) preferred by hares, rather than the species (Ferron and Oulette 1992).

b. Thinning, partial harvests, lopping, or other treatments that may prolong forage conditions and/or to create forage opportunities in understories of mature stands will be considered.

8. *Small Ecosystem/Ecological Communities.* Denning Habitat identified for the purpose of meeting the 10%per LAU minimum requirement stated in [4], where DNR manages 20% or more of a LAU, will be selected according to the criteria below.

a. First priority Denning Habitat will contain known lynx den sites. WDFW will provide the locations of known lynx dens to ensure that stands which currently or historically supported lynx dens are protected.

b. Second priority Denning Habitat will be identified in pre-sale harvest unit inventories. Denning Habitat will contain suitable denning structure such as deadfall arranged to provide structural diversity 1-4 feet (0.3-1.2 m) above ground. Stands that are 5 acres (1ha) or greater with more than one potential den site will receive highest priority. Preference will be given to stands as indicated below. Den sites are discussed under [10].

- i. mature to over-mature stands of spruce/fir or similar mesic association with north or northeast aspects
- ii. stands that have mesic associations with other aspects
- iii. stands that have mature to over-mature overstories without mesic associations

9. *Small Ecosystem/Ecological Communities.* Potential human related disturbance to den sites will be minimized by locating potential den sites as far from roads as practical (goal 0.25 mile or 0.4 km, WDFW 1996), where DNR-manages 20% or more of a LAU.

10. *Small Ecosystem/Ecological Communities.* To ensure that den sites are available across the landscape, at least two den sites per square mile will be provided. Many den sites will overlap with the Denning Habitat identified in LAU's where DNR manages at least 20% of the area, as indicated in [4], above. Den sites will contain suitable denning structure, such as deadfall layered to provide structural diversity 1-4 feet (0.3-1.2 m) above ground. Larger deadfall diameters will be selected over smaller diameters (WDFW 1996). Priority for den site selection will be as follows:

- a. Known den sites.
- b. Den sites within Denning Habitat, following priorities listed under [8.b].
- c. Den sites within other types of lynx habitat:
  - i. sites within Travel Habitat
  - ii. sites within Forage Habitat
  - iii. sites within Temporary Non-lynx Area
- d. If no existing denning structure can be found, den sites may be artificially constructed. DNR's region biologist will coordinate with WDFW to survey existing den sites and recommend details of artificial den size and structure. In addition:
  - i. Logs used for artificial den site creation will reflect what is available on the site and within each square mile section.
  - ii. The maximum number of jack-strawed down logs possible will be used to create artificial den sites, given regeneration concerns and log availability.
  - iii. Sites on north or northeast aspects will be selected over other aspects, if available.
  - iv. Sites with mesic plant associations will be selected, if present.

## APPENDIX C

Supporting material for Chapter 5.

C1: Acres under management regimes by decade for the Loomis State Forest, by LAU.

<b>LAU</b>	<b>Decade</b>	<b>Evenaged</b>	<b>Unevenaged</b>	<b>No activity</b>
North	1	4,590	5,694	37,376
	2	1,460	0	46,200
	3	2,266	0	45,394
	4	2,038	0	45,622
	5	1,669	0	45,991
	6	1,176	0	46,484
	7	1,351	0	46,309
	8	1,555	0	46,105
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Central	1	5,665	2,027	54,772
	2	1,391	110	60,963
	3	1,826	110	60,528
	4	2,664	110	59,690
	5	1,458	0	61,006
	6	2,020	0	60,444
	7	2,521	0	59,943
	8	2,481	0	59,983
<hr/>				
South	1	4,079	3,023	48,538
	2	3,323	360	51,597
	3	2,647	360	52,273
	4	1,633	360	53,647
	5	1,992	0	53,648
	6	1,992	0	53,648
	7	1,405	0	54,235
	8	1,321	0	54,319

C2: Acres under management regimes by decade for the Little Pend Oreille Block.

LAU	Decade	Evenaged	Unevenaged	No activity
Little Pend	1	1,337	843	13,466
Oreille	2	625	835	14,186
Block	3	1,017	717	13,911
	4	1,494	843	13,309
	5	1,231	835	13,580
	6	1,650	787	13,209
	7	1,551	843	13,252
	8	720	835	14,091

C3: Acres of lynx habitat components modeled for the planning period by LAU for Loomis State Forest (5 year intervals) and LAU18 (10 year intervals) Loomis.

LAU	Period	Lynx Habitat			
		Temp. Non Lynx	Forage	Travel	% of travel > 90 yrs. old
North	0	1,958	53	865	18,538
88% of LAU	1	4,700	147	687	15,880
is habitat	2	5,171	237	195	15,812
	3	4,931	1,123	195	15,165
	4	2,831	4,036	174	14,373
	5	2,758	5,357	333	12,966
	6	2,834	5,552	843	12,184
	7	3,574	5,010	1,753	11,077
	8	3,044	3,568	4,559	10,242
	9	3,743	2,157	6,095	9,419
	10	3,625	2,916	6,299	8,574
	11	3,525	2,999	6,743	8,147
	12	2,796	3,092	8,127	7,398
	13	1,979	3,951	8,421	7,063
	14	2,564	3,587	9,215	6,047
	15	2,695	3,669	10,006	5,045
	16	2,718	2,727	11,437	4,533

C3 (cont.): Acres of lynx habitat components modeled for the planning period by LAU for Loomis State Forest (5 year intervals) and the Little Pend Oreille Block (10 year intervals) Loomis.

		Lynx Habitat			
LAU	Period	Temp. Non-Lynx	Forage	Travel	% of travel > 90 yrs. old
<b>Central</b>	0	5,261	0	394	24,714
92% of LAU	1	7,600	623	102	22,044
is habitat	2	6,789	304	102	23,174
	3	5,176	2,509	52	22,632
	4	3,231	5,251	0	21,886
	5	3,002	6,166	304	20,897
	6	3,302	5,202	1,804	20,061
	7	3,984	4,168	3,505	18,681
	8	4,286	3,180	5,506	17,397
	9	4,624	2,124	6,947	16,673
	10	5,030	2,394	7,006	15,939
	11	4,895	2,753	7,704	15,017
	12	4,534	3,182	8,734	13,919
	13	4,085	4,609	9,174	12,500
	14	4,460	4,961	9,550	11,397
	15	4,384	4,888	10,707	10,389
	16	4,905	4,256	12,232	8,975
<b>South</b>	0	3,507	504	1,820	21,204
86% of LAU	1	6,268	504	1,188	19,075
is habitat	2	6,521	68	842	19,604
	3	5,990	1,933	783	18,328
	4	5,701	4,211	775	16,347
	5	6,188	4,755	683	15,409
	6	5,472	5,623	1,905	14,034
	7	5,967	4,318	3,309	13,441
	8	6,163	3,588	4,745	12,539
	9	5,924	3,134	6,468	11,508

C3 (*cont.*): Acres of lynx habitat components modeled for the planning period by LAU for Loomis State Forest (5 year intervals) and the Little Pend Oreille Block (10 year intervals).

LAU	Period	Lynx Habitat			
		Non Habitat	Forage	Travel	% of travel >
<b>South</b>	11	5,966	3,843	7,490	9,735
<i>cont.</i>	12	5,327	4,711	8,284	8,713
	13	5,187	4,055	9,716	8,077
	14	5,121	3,916	10,690	7,308
	15	4,517	4,500	11,439	6,579
	16	4,220	3,480	13,202	6,132
<b>Little</b>	0	2,039	381	1,067	12,159
<b>Pend</b>	1	1,922	1,863	1,039	10,822
<b>Oreille</b>	2	834	2,841	1,428	10,543
<b>Block</b>	3	1,916	1,989	2,215	9,526
97% of LAU	4	3,026	1,851	2,737	8,032
is habitat	5	2,699	3,410	2,736	6,801
	6	2,373	4,257	3,742	5,274
	7	1,649	4,349	5,633	4,016
	8	929	3,924	6,159	4,633

C4: Regeneration lag sensitivity analysis for Loomis LAU's (acres and % lynx habitat).

LAU	Decade	Assumed regeneration time	% of lynx habitat	Subtracting 5 years from zone 3	% of lynx habitat	Adding 5 years to zone 1	% of lynx habitat	Adding 10 years to zone 1	% of lynx habitat
North	0	817	3%	1958	8%	817	3%	817	3%
		3762	16%	4700	20%	3762	16%	3762	16%
	1	5407	23%	5171	22%	5407	23%	5407	23%
		5441	23%	4931	21%	5817	24%	6054	25%
	2	3441	14%	2831	12%	5744	24%	6630	28%
		3281	14%	2554	11%	4316	18%	7229	30%
	3	3335	14%	2703	11%	3335	14%	4893	21%
		3574	15%	3574	15%	3887	16%	4387	18%
	4	3044	13%	2920	12%	4428	19%	4741	20%
		3743	16%	3743	16%	3743	16%	5127	22%
	5	3795	16%	3524	15%	4589	19%	4589	19%
		3524	15%	2743	12%	3951	17%	4915	21%
	6	3060	13%	2407	10%	3493	15%	3919	16%
		2236	9%	1721	7%	2942	12%	3438	14%
	7	2681	11%	2175	9%	2937	12%	3499	15%
		2695	11%	2617	11%	3177	13%	3349	14%
	8	3084	13%	2604	11%	3170	13%	3652	15%
Central	0	1067	3%	5261	17%	1067	3%	1067	3%
		4694	15%	7600	24%	4694	15%	4694	15%
	1	6732	22%	6789	22%	6732	22%	6732	22%
		6315	20%	5176	17%	7020	22%	7324	23%
	2	3897	12%	3231	10%	5612	18%	7817	25%
		2897	9%	2943	9%	3861	12%	6603	21%
	3	3418	11%	2891	9%	3418	11%	4637	15%
		3623	12%	3937	13%	3910	13%	4387	14%
	4	3925	13%	3949	13%	4861	16%	5148	16%
		4311	14%	4590	15%	4311	14%	5247	17%
	5	4772	15%	4975	16%	4964	16%	5012	16%
		4684	15%	4060	13%	5535	18%	5831	19%
	6	4424	14%	3394	11%	4798	15%	5799	19%
		4099	13%	3756	12%	4452	14%	5076	16%
	7	4099	13%	4260	14%	4498	14%	5225	17%
		4535	15%	4252	14%	4908	16%	5306	17%
	8	4919	16%	4758	15%	5364	17%	6248	20%

C4 (*cont.*): Regeneration lag sensitivity analysis for Loomis LAU's (acres and % lynx habitat).

LAU	Decade	Assumed regeneration time	% of lynx habitat	Subtracting 5 years from zone 3	% of lynx habitat	Adding 5 years to zone 1	% of lynx habitat	Adding 10 years to zone 1	% of lynx habitat
South	0	1459	5%	3507	13%	1459	5%	1459	5%
		4221	15%	6268	23%	4221	15%	4221	15%
	1	5538	20%	6521	23%	5538	20%	5538	20%
		6886	25%	5990	22%	6804	24%	6872	25%
	2	5586	20%	5701	20%	6928	25%	8793	32%
		5367	19%	5264	19%	5747	21%	8026	29%
	3	5763	21%	5449	20%	5963	21%	6374	23%
		4915	18%	5967	21%	4992	18%	6334	23%
	4	5112	18%	5059	18%	5954	21%	6031	22%
		4981	18%	5353	19%	5038	18%	5881	21%
	5	5017	18%	5542	20%	5264	19%	5430	20%
		5070	18%	4473	16%	5302	19%	5821	21%
	6	4539	16%	5089	18%	4602	17%	4989	18%
		4489	16%	4651	17%	4674	17%	5000	18%
	7	4276	15%	4309	15%	4369	16%	4907	18%
		3553	13%	4003	14%	3987	14%	4287	15%
	8	3493	13%	3855	14%	3543	13%	4065	15%